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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/574,264

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Jae Kap Lee

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EXAMINER

MILLER, JR, JOSEPH ALBERT

ART UNIT

PAPER NUMBER

4162

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/574,264	<b>Applicant(s)</b> LEE ET AL.	
	<b>Examiner</b> JOSEPH MILLER JR	<b>Art Unit</b> 4162	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 February 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/02/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 1 and 8 are objected to because of the following informalities: they refer to forming a “diamond” in the preambles but in each claim refer to a “hollow diamond shell” and “diamond particles”, respectively. The claimed invention would be clearer to use a modifier in the preamble of each claim (such as diamond film or the existing terminology).

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Instant claim states “usable”. It is not clear what this word adds to the claim as written. The claim will be read without this word for examination purposes.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones (5,114,745).

Jones teaches a method of producing a diamond film having a desired profile by forming solid carbon substrate coated with a carbide layer and removing the substrate (and optionally carbide layer) via etch (col 2, lines 8-10) after formation of the diamond layer (abstract) by CVD (col 2, lines 3-7).

Regarding claim 2, Jones teaches that the diamond film will typically have an area of at least  $10\text{mm}^2$  (col 2, lines 58-60). Instant claim teaches a length of matrix up to 2mm, providing an area of over  $12\text{mm}^2$  if that length were a radius, which is an acceptable measurement of “length” in reference to a sphere.

The MPEP, section 2144.04 states that the variation of size of an object over the prior art does not necessarily make it non-obvious. In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions could not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Regarding claim 7, Jones teaches a diamond film which is “completely free standing” (col 2, lines 22-24) and therefore teaches a diamond shell which is a geometrical figure.

Regarding claim 8, Jones teaches a method of producing a diamond film having a desired profile by forming solid carbon substrate coated with a carbide layer and removing the substrate (and optionally carbide layer) after formation of the diamond layer (abstract) by CVD (col 2, lines 3-7). Furthermore, the substrate may be removed by etching (col 2, lines 8-10).

Claims 1, 2, 6 - 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kley (7,309,446).

Kley teaches a diamond shell grown around a form substrate where the substrate may be removed through an opening in the shell (abstract).

Kley teaches a "suitably shaped" (abstract) substrate which can be removed after diamond film growth (col 6, lines 41-52) via CVD (col 6, lines 43-57).

Regarding claim 2, Kley teaches that the shell may have a major length axis between 20 microns and about 1 meter - thereby teaching on instant range.

Regarding claim 6, Kley teaches an embodiment where the resulting surface corresponds to the (100) plane of diamond lattice (col 26, lines 8-10).

Regarding claim 7, Kley teaches a diamond shell (abstract), it is inherent that a shape has a "geometrical shape".

Regarding claim 8, Kley teaches a "suitably shaped" (abstract) substrate which can be removed after diamond film growth (col 6, lines 41-52) via CVD (col 6, lines 43-57).

Regarding claim 9, Kley teaches that the shell may have a major length axis between 20 microns and about 1 meter - thereby teaching on instant range.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kley (7,309,446) in view of Pope (2004/01992620).

Kley teaches a diamond shell grown around a form substrate where the substrate may be removed through an opening in the shell.

Kley does not teach coating the surface with vibration.

Pope teaches a method of diamond coating a surface via CVD and that the surface may be vibrated or rotated during the deposition step [0179]. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the vibration as taught by Pope during the diamond CVD process to the diamond coating process of Jones because it would allow for "all desired surfaces" of the object being coated to become exposed [0179].

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kley (7,309,446) in view of Linares (2003/0205190).

Kley teaches a diamond shell grown around a form substrate where the substrate may be removed through an opening in the shell.

Kley does not teach nucleation of diamond on the matrix surface by using diamond powders in an ultrasonic bath.

Linares teaches a system and method for producing synthetic diamond (abstract). Linares teaches that it is known to use diamond powder, agitated in an ultrasonic bath in order to enhance nucleation of diamond [0019]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of agitation with diamond powder taught by Linares with the diamond shell formation method taught by Kley because nucleating diamond before CVD would enable the vapor deposition to proceed more quickly.

Regarding claim 5, Kley teaches attachment of the substrate to a pedestal using "carbon dag" (i.e. paste) prior to the diamond growth process (col 34, lines 3-7). Kley uses the substrate held on a pedestal with paste to "create a diamond shell with an opening corresponding to the shape of the surface of (the) pedestal" (col 34, lines 8-10).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Anthony (5,869,133) teaches a method of producing diamond coated articles by chemical vapor deposition on supports.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH MILLER JR whose telephone number is



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(571)270-5825. The examiner can normally be reached on Monday through Thursday from 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil, can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/JOSEPH MILLER JR/  
Examiner, Art Unit 4162

/Jennifer McNeil/

Supervisory Patent Examiner, Art Unit 4162